

REMARKS

1. The Patent Office Action of May 18, 2005 is hereby acknowledged. The shortened statutory period of three (3) months time period for response to the Office Action expires on August 18, 2005. This amendment is being mailed by United States Express Mail, Express Mail Label No. EV 593949730 US in a postage paid envelope addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 14, 2005. Time for response to the Office Action of May 18, 2005 expired on August 18, 2005. Concurrently with the filing of this amendment, the Applicant has requested a one month extension of time and has paid the required fee. Accordingly, the deadline to now file a responsive amendment is September 18, 2005. Therefore, this amendment is timely filed. In the event that the Commissioner for Patents should determine that any additional fee is required for this Amendment to be timely filed and an appropriate fee is due for that extension of time, then the Commissioner for Patents is hereby authorized to charge Deposit Account Number 18-2222 for such appropriate fee.

2. The original '766 Application had nine (9) total claims wherein one (1) was an independent claim. The application still currently has nine (9) claims of invention with only one independent claim. Accordingly, no additional filing fee is due. In the event that the Commissioner for Patents should determine that any additional fee is due, then the Commissioner for Patents is hereby authorized to charge Deposit Account Number 18-2222 for the appropriate fee.

3. The Examiner has rejected all pending claims of invention under 35 U.S.C. 102(b) as being anticipated by published patent application US 2002/0021779 A1 to Murakami et al. published on February 21, 2002 for "ALUMINUM COMPOSITE MATERIAL, ALUMINUM COMPOSITE POWDER AND ITS MANUFACTURING METHOD, SPENT FUEL STORAGE MEMBER AND ITS MANUFACTURING

1 METHOD" (hereafter "Murakami"). The Applicant has very carefully studied the  
2 Murakami reference and has also carefully studied what the Patent Examiner has said in  
3 Paragraph 2 of the Office Action. The Applicant very respectfully disagrees with the Patent  
4 Examiner.

5 3.01 The Murakami publication discloses a totally different type of product  
6 for a totally different purpose from the present invention. Specifically, the Murakami  
7 reference is for a neutron absorbing material for spent nuclear fuel storage. As discussed in  
8 Claim 1 and also as discussed in Paragraph 37 through 41, the neutron absorbing material  
9 of Murakami must have three types of starting materials. They include (1) aluminum or  
10 aluminum alloy powder; (2) neutron absorber powder including B, B compound, Cd, Hf  
11 rare earth element or other elements having a wide neutron absorbing sectional area; and  
12 (3) particles of oxide, nitride, carbide or boride. Many neutron absorbing elements and its  
13 compounds do not increase the strength and stiffness of the final composite but in fact,  
14 decrease it such as and  $B_2O_3$ . They react with aluminum to form A1B compound, which is  
15 brittle and significantly decreases the strength and toughness of the final composite.

16 3.02 Further, the neutron absorbing material according to the Murakami  
17 disclosure requires the use of mechanical alloying as a step in the manufacturing of the  
18 material described in this application. Claims 1, 6, 7, 17, 22 and 27 clearly state that the  
19 mixing of the powders is done by mechanical alloying. Paragraph 40 states that the A1/A1  
20 alloy powder, the B or B compound and the third particles are finely ground and kneaded  
21 uniformly.

22 3.03 The mechanical alloying process uses an attriter mill or a ball mill to  
23 grind and knead powders to finer particle size and to mix all ground powders uniformly. It  
24 is a time consuming and expensive technique.

25 3.04 In summary, the Murakami disclosure is specifically for the purpose of  
26 having a composite material which is for a neutron absorbing material and is for the  
27 purpose of absorbing spent nuclear fuel storage. The neutron absorbing material disclosed  
28 by Murakami has two key starting materials which are aluminum powder and neutron

1 absorbing powder. It does not have any particles for increasing its strength of the stiffness.  
2 There would be no purpose for this because its entire purpose is to be an absorber of spent  
3 nuclear fuel.

4  
5 4. In complete contrast, the nanocomposite of the present invention is for  
6 producing materials which in the end product are high strength, high stiffness products to  
7 be used for producing a nanocomposite that can be incorporated into products. It has  
8 nothing whatsoever to do with absorbing any nuclear spent fuel. As a result, the entire  
9 purpose of the present invention is totally different and the specific features and properties  
10 of the present invention as clearly claimed are also totally different. In order to clearly  
11 emphasize this, the Applicant has amended Claim 1 so that Claim 1 now reads "A  
12 nanocomposite comprising:

- 13 a. an aluminum alloy phase;  
14 b. a nano-scale aluminum oxide phase to provide strength to the  
15 nanocomposite; and  
16 c. a modulus phase of microsized ceramic particles to provide stiffness to the  
17 nanocomposite."

18 The key underlined provisions clearly serve to further differentiate the  
19 present invention from the Murakami disclosure.

20 4.01 The high strength and high strength nanocomposite of the present  
21 invention has three compounds: (1) aluminum alloy aluminum alloy particles which are  
22 also found in Murakami; (2) nano size aluminum oxide particles to provide strength to the  
23 nanocomposite which is not shown or disclosed in the Murakami reference; and (3) the  
24 modulus phase of micro size ceramic particles to provide stiffness to the nanocomposite  
25 which is not shown in the Murakami reference. The present invention does not require the  
26 step of specifically grinding and kneading the powders. The aluminum powder of the  
27 present invention is carefully prepared by the method disclosed in the patent application  
28

1 specification so that the powder contains control percentages and nano size aluminum  
2 oxides. The ceramic powder for stiffness enhancements can be directly mixed uniformly  
3 with the aluminum powder having the controlled aluminum oxide.

4 4.02 With the invention as now claimed, it is respectfully submitted that the  
5 present invention is not disclosed or made obvious by the Murakami reference.

6  
7 5. The key differences between the present '766 Application as now claimed  
8 and the cited Murakami reference are as follows:

9 5.01 The Murakami disclosure is for a neutron absorbing material for spent  
10 nuclear storage; whereas, the present invention is a nanocomposite that has strength and  
11 stiffness for producing an end product nanocomposite. It has nothing to do with neutron  
12 absorption.

13 5.02 The neutron absorbing material disclosed by the Murakami references  
14 has only two starting materials which are aluminum powder and neutron absorber powder.  
15 It does not have third particles for increasing the strength. The high strength and high  
16 strength nanocomposite of the present invention has three compounds as specifically set  
17 forth in Claim 1.

18 5.03 The neutron absorbing material of the Murakami publication requires  
19 the use of mechanical alloying as a step in the manufacturing of the materials described in  
20 the application. The present invention does not have any such requirement.

21 5.04 Therefore, the present '766 Application has at least one additional  
22 material as set forth in Claim 1 for the purpose of providing high strength which is  
23 unnecessary in the Murakami reference since its whole purpose is different and the modulus  
24 phase of the micro sized ceramic particles is also not disclosed or made obvious by  
25 Murakami. Clearly, the Murakami reference is for a totally different product for a totally  
26 different purpose and is completely different from the present invention.  
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28

Date: September 14, 2005

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